



**UvA-DARE (Digital Academic Repository)**

**Blöte and Nienhuis reply**

Blöte, H.W.; Nienhuis, B.

*Published in:*  
Physical Review Letters

*DOI:*  
[10.1103/PhysRevLett.73.2787](https://doi.org/10.1103/PhysRevLett.73.2787)

[Link to publication](#)

*Citation for published version (APA):*

Blöte, H. W., & Nienhuis, B. (1994). Blöte and Nienhuis reply. *Physical Review Letters*, 73(20), 2787-2787. DOI: 10.1103/PhysRevLett.73.2787

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <http://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

**Blöte and Nienhuis Reply:** The results reported by Kondev and Henley in the preceding Comment [1] constitute very interesting additional information on the fully packed loop (FPL) model [2–6]. Not only did they for the case  $n = 2$  confirm analytically our numerical values [6] of the central charge and exponents, they also obtained additional exponents. The explicit equivalence of the FPL model to a solid-on-solid (SOS) model with two-dimensional height variables, is very clarifying.

Kondev and Henley [1] raise the question why the critical dimension  $X = \frac{2}{3}$  governing the asymptotic behavior of the color-color correlation function [5] does not show up in our results [6]. This dimension is smaller than the temperature dimension  $X_t$ , and the corresponding transfer-matrix eigenvalue should therefore dominate. The explanation lies in the fact that, in the spectrum of the loop model transfer matrix, the eigenstate corresponding with  $X = \frac{2}{3}$  is *not translationally invariant*. In contrast, the transfer-matrix results presented in our Letter apply to translationally invariant eigenstates [6].

Using the language of the loop representation, empty bonds correspond with one of the three colors. Thus one can explicitly compute color-color correlations using the transfer matrix for the  $n = 2$  FPL model wrapped on a cylinder. We performed such calculations using finite sizes  $L = 3, 6, \text{ and } 9$ . The results for the correlation

length agree very well with the presence of a color dimension  $X = \frac{2}{3}$ .

H. W. J. Blöte<sup>1</sup> and B. Nienhuis<sup>2</sup>

<sup>1</sup>Laboratorium voor Technische Natuurkunde  
Technische Universiteit Delft  
P.O. Box 5046  
2600 GA Delft, The Netherlands

<sup>2</sup>Instituut voor Theoretische Fysica  
Universiteit van Amsterdam  
Valckenierstraat 65  
1018 XE Amsterdam, The Netherlands

Received 2 June 1994

PACS numbers: 75.10.Hk, 64.60.Ak, 64.60.Fr, 64.60.Kw

- [1] J. Kondev and C.L. Henley, preceding Comment, Phys. Rev. Lett. **73**, 2786 (1994).
- [2] R. J. Baxter, J. Math. Phys. **11**, 789 (1970).
- [3] J. Suzuki and T. Izuyama, J. Phys. Soc. Jpn. **57**, 818 (1988).
- [4] N. Yu. Reshetikhin, J. Phys. A **24**, 2387 (1991).
- [5] D. A. Huse and A. D. Rutenberg, Phys. Rev. B **45**, 7536 (1992).
- [6] H. W. J. Blöte and B. Nienhuis, Phys. Rev. Lett. **72**, 1372 (1994).